



Math Objectives

- Students will explore the relationship between angles and parallel lines cut by a transversal.
- Students will reason abstractly and quantitatively (CCSS Mathematical Practice).

Vocabulary

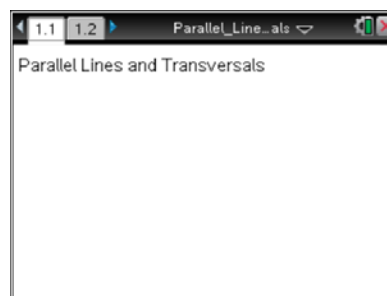
- parallel
- transversal
- linear pair
- corresponding angles

About the Lesson

- The time varies for this activity depending on whether the .tns file is provided or created by the students.
- Send the file Parallel_Lines_and_Transversals.tns to student handheld devices. If you are planning for students to create the file, take time to follow the directions prior to facilitating the process with students.
- This activity is designed to be student-centered, with the teacher acting as a facilitator while students work cooperatively. The student worksheet is intended to guide students through the activity and provide a place to record their answers.

TI-Nspire™ Navigator™ System

- Use Screen Capture to observe students' work as they proceed through the activity.
- Use Live Presenter to have a student illustrate how he or she used a certain tool.



TI-Nspire™ Technology Skills:

- Download a TI-Nspire document
- Open a document
- Move between pages
- Grab and drag a point

Tech Tips:

- Make sure the font size on your TI-Nspire handheld is set to Medium.
- You can hide the function entry line by pressing **ctrl** **G**.

Lesson Materials:

Create Instructions
Parallel_Lines_and_Transversals_Create.pdf




Student Activity
Parallel_Lines_and_Transversals_Student.pdf
Parallel_Lines_and_Transversals_Student.doc

TI-Nspire document
Parallel_Lines_and_Transversals.tns

Visit www.mathnspired.com for lesson updates and tech tip videos.



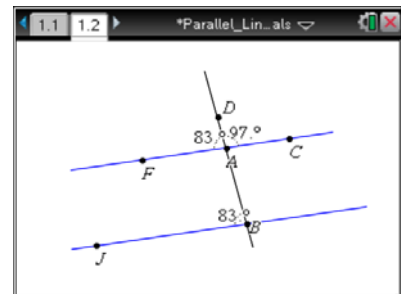
Discussion Points and Possible Answers

Tech Tip: If students experience difficulty dragging a point, check to make sure that they have moved the arrow until it becomes a hand (). Press **ctrl** () to grab the point and close the hand ().

Move to page 1.2.

On page 1.2, you see two parallel lines cut by a transversal. Measure the vertical angle to $\angle FAB$, starting with point D . Label the third point C , to the right of point A , to form $\angle DAC$.

$\angle DAF$ and $\angle DAC$ form a linear pair.



1. Identify two other linear pairs.

Answer: $\angle DAC$ and $\angle CAB$; $\angle CAB$ and $\angle BAF$; $\angle BAF$ and $\angle FAD$

2. Name at least two pairs of supplementary angles that are not linear pairs.

Answer: $\angle JBA$ and $\angle DAC$; $\angle JBA$ and $\angle FAB$

3. Identify two other angles that have the same measure as $\angle DAF$.

Answer: $\angle CAB$ and $\angle JBA$ are the two angles that are labeled.

Teacher Tip: It is important for students to name angles properly. If students take the initiative to measure and/or label the angle vertical to $\angle JBA$, they would have that named angle as well.

$\angle DAF$ and $\angle ABJ$ are corresponding angles.

Move the cursor to line JB until the line is bold and the cursor becomes a hand. Grab the line. Use the arrows to move the line around.

4. What conjecture can you make about corresponding angles?

Answer: When two parallel lines are cut by a transversal, corresponding angles have the same angle measure.



Grab and move point D to the left and to the right.

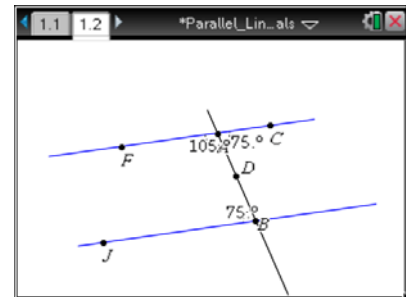
5. Find at least two different places where the measures of $\angle DAF$ and $\angle DAC$ are the same angle.
Record your angle measures.

Answer: Angle measures may vary. When point D is moved so that point A is to the left of point F , $\angle DAF$ and $\angle DAC$ will have the same angle measure. When point D is moved so that point A is to the right of point C , $\angle DAF$ and $\angle DAC$ will have the same angle measure.

Grab and move point D so that the transversal is between points F and C . Then move point D down the transversal so that it is between points A and B .

6. What relationships do you see?

Answer: $\angle FAB$ and $\angle JBD$ are now same-side interior angles and are supplementary. $\angle JBD$ and $\angle DAC$ are alternate interior angles and are congruent.



7. Which of the following statements are true? Explain your reasoning using what you have learned in this activity.

- a. All supplementary angles form a linear pair.

Answer: False. Two angles do not have to be adjacent to be supplementary.

- b. All angles that form a linear pair are supplementary.

Answer: True. By definition, angles that form a linear pair lie on a straight angle that measures 180 degrees.

- c. All corresponding angles are congruent.

Answer: False. Corresponding angles have the same angle measure only when they are formed by parallel lines and a transversal.

Wrap Up

Upon completion of the discussion, the teacher should ensure that students can explain:

- The relationship between angles and parallel lines cut by a transversal.